UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/574,900	05/19/2000	Xavier Michel	SONY-T0591	1240

7590 01/05/2005

SONNENSCHEIN NATH & ROSENTHAL
P.O. Box 061080
Wacker Drive Station- Sears Tower
Chicago, IL 60606-1080

EXAMINER	
DASTOURI, MEHRDAD	
ART UNIT	**PAPER NUMBER**
2623	

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/574,900	MICHEL ET AL.	
	Examiner	Art Unit	
	Mehrdad Dastouri	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed September 10, 2004, has been entered and made of record.

Response to Arguments

2. Applicants' arguments filed September 10, 2004, have been fully considered but they are not persuasive.

3. Applicants argue in essence that prior art of record (Schultz et al.) does not disclose non-Huber type energy function as set forth in the present invention.

The Examiner disagrees and indicates that prior art of record utilizes a Huber-Markov random field model that is not a mere Huber energy function. Claim language does not recite any details regarding the smoothness function $S'_v(X)$ in Formula 14 to particularly distinguish the present invention from the teachings of prior art of record.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Schultz et al (A Bayesian Approach to Image Expansion for Improved Definition; IEEE Paper ISBN: 1057-7149).

Regarding Claim 1, Schultz et al disclose a picture processing method comprising the steps of:

preparing in advance a non-Huber function picture energy function (Pages 235-236, Sections IV and V, Formulas 20 and 21, Huber-Markov random field (HMRF) image model);

preparing an enlarged input picture (Page 234; Figure 2);

calculating gradient values of said energy function for a pixel in the enlarged picture (Page 236, Column 2, Gradient $g_{(n)}$);

adding together a sum of the gradient values of said energy function and a value not dependent

on the input picture to said pixel (Page 237, Page 238, Column 1, Consistency term, Temperature Parameter λ); and

updating the resulting value of said pixel for picture quality adjustment (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 2, Schultz et al further disclose the picture processing method according to Claim 1 wherein the updating processing of the pixel value is repeated a plurality of number of times (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 3, Schultz et al further disclose the picture processing method according to Claim 1 wherein said value not dependent on the input picture is determined in advance from a plurality of pixels (Pages 237-238, Formulas 33 and 34).

Regarding Claim 4, Schultz et al disclose a picture processing method comprising the steps of:

preparing in advance a non-Huber function picture energy function of a picture varied depending on an input picture (Page 236, Column 2, Formulas 20 and 21, Huber-Markov random field (HMRF) image model);

preparing an enlarged input picture (Page 234; Figure 2);

calculating a value which decreases said energy function for a pixel of the enlarged picture (Pages 236-237, Negative gradient $-g_{(n)}$);

adding said energy decreasing value to said pixel (Page 237, Column 2, Gradient Projection Algorithm, Steps 3 and 4; Page 238, Column 1, Gradient Descent Algorithm, Steps 3 and 4); and

updating the resulting value of said pixel for picture quality adjustment (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 5, Schultz et al further disclose the picture processing method according to Claim 4 wherein the energy function of the picture varied depending on the input picture is the sum total of the pixel energies changed with pixel values of plural pixels in the vicinity of each pixel (Page 237, Column 2, Gradient Projection Algorithm; Page 238, Column 1, Gradient Descent Algorithm).

Regarding Claim 6, Schultz et al further disclose the picture processing method according to Claim 4 wherein the energy decreasing value is a product of a gradient

value of the energy function in the pixel of the enlarged picture with the value not dependent on the input picture (Page 237, Column 1; Value "-1" to generate - $g_{(n)}$).

Regarding Claim 7, Schultz et al further disclose the picture processing method according to Claim 4 wherein the updating processing of the pixel value is repeated a plurality of number of times (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

With regards to Claim 8, arguments analogous to those presented for Claims 1 and 4 are applicable to claim 8.

Regarding Claim 9, Schultz et al disclose a picture processing apparatus comprising the steps of:

holding means for holding a non-Huber function picture energy function prepared in advance (Pages 235-236, Sections Iv and V, Formulas 20 and 21, Huber-Markov random field (HMRF) image model);

enlarging means for enlarging an input picture (Page 234; Figure 2);

calculating means for calculating a gradient values of said energy function for a pixel in the enlarged picture (Page 236, Column 2, Gradient $g_{(n)}$); and

updating means for adding to said pixel a product of the gradient values of said energy function with a value not dependent on the input picture (Value "-1" to generate - $g_{(n)}$) and for updating the resulting value of said pixel (Pages 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 10, Schultz et al further disclose the picture processing apparatus according to Claim 9 wherein the calculating processing by said calculating means and the updating processing by said updating means are repeated a plurality of number of times (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 11, Schultz et al further disclose the picture processing apparatus according to Claim 9 wherein said value not dependent on the input picture is found in advance from a plurality of pixels Page 237, Column 2, Section V.B).

Regarding Claim 12, Schultz et al disclose a picture processing apparatus comprising:

holding means for holding a non-Huber function picture energy function prepared in advance varied depending on an input picture (Pages 235-236, Sections IV and V, Formulas 20 and 21, Huber-Markov random field (HMRF) image model);

enlarging means for enlarging the input picture (Page 234; Figure 2);

calculating means for calculating an energy decreasing value for a pixel in the enlarged picture (Pages 236-237, Negative gradient $-g_{(n)}$); and

updating means for adding said energy decreasing value to said pixel and for updating the resulting pixel value(Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 13, Schultz et al further disclose the picture processing apparatus according to Claim 12 wherein said holding means holds the sum total of pixel energies varied depending on pixel values of plural pixels in the vicinity of each

pixel as a function of the energy of the picture varied depending on said input picture (Page 237, Column 2, Gradient Projection Algorithm; Page 238, Column 1, Gradient Descent Algorithm).

Regarding Claim 14, Schultz et al further disclose the picture processing apparatus according to Claim 12 wherein said updating means adds a product of a gradient value of said energy function in a pixel in the enlarged picture with a value not dependent on the input picture as said energy decreasing value to said pixel (Page 237, Column 1; Value "-1" to generate - $g_{(n)}$).

Regarding Claim 15, Schultz et al further disclose the picture processing apparatus according to Claim 12 wherein said calculating operation by said calculating means and said updating operation by said updating means are repeated a plurality of number of times (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Regarding Claim 16, Schultz et al further disclose a picture processing apparatus comprising:

holding means for holding a non-Huber function picture energy function prepared in advance (Pages 235-236, Sections IV and V, Formulas 20 and 21, Huber-Markov random field (HMRF) image model);

enlarging means for enlarging an input picture (Page 234; Figure 2);

calculating means for calculating an energy decreasing value for a pixel of the picture enlarged by said enlarging means (Pages 236-237, Negative gradient $-g_{(n)}$); and

updating means for adding said energy decreasing value to said pixel to update the pixel value (Page 237, Column 2, Gradient Projection Algorithm, Steps 3 and 4; Page 238, Column 1, Gradient Descent Algorithm, Steps 3 and 4); said calculation operation by said calculating means and the updating operation by said updating means being repeated a pre-set number of times (Page 237, Column 2, Gradient Projection Algorithm, Steps 4 and 5; Page 238, Column 1, Gradient Descent Algorithm, Steps 4 and 5).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MEHRDAD DASTOURI
PRIMARY EXAMINER
Mehrdad Dastouri

Mehrdad Dastouri
Primary Examiner
Art Unit 2623
December 29, 2004